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ABSTRACT

Neuropsychological theorizing has led to applied learning disability screening beyond the present knowledge of neurodevelopment of the five-year-old child. A study was undertaken to evaluate the stability and prediction of a language/general intelligence discrepancy at an early age (4.5) to a language/learning disability at a later age (7.8). Subjects included 51 children who were identified as having a language-learning disability at ages seven to eight. All children with identifiable hearing loss or neurological deficit were excluded. The criteria for language-learning disability was a low verbal/high performance WISC profile and an identified reading disability of at least one year below age expectation on the Wide Range Achievement Test. Results indicated that early discrepancy scores between language and general intelligence are suggestive of later language-learning disability. This provides support for a linear developmental approach to language discrepancy as an early predictor of reading failure. (HOD)

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Early Identification of Language-Learning Disabled Children

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Early Identification of Language-Learning Disabled Children

While many early preschool or kindergarten inventories of learning ability were frequently based upon pediatric-neurological evaluations or psychological testing, more recent efforts have focused on more specific neuropsychological functioning. This change in emphasis on preschool assessment is based on neurodevelopmental theories of differences in discrete cognitive abilities. These theories assume that separate neuropsychological distinctions can be made at this early age. All of the separate abilities purported to be measured by many of these screening inventories are too numerous to mention but typically include sensory, perceptual, motor, memory and psycholinguistic skill areas. However, at the present time the few longitudinal studies available suggest numerous difficulties in predictive validity, reliability of measurement and differential results based on inventories loaded according to the authors particular theoretical formulation.

The most notable of the disagreements in kindergarten assessment is the difference between Satz, who emphasizes sensory-perceptual deficits as predictive precursors of reading failure, versus Jansky and deHirsh, who focus on linguistic deficits as predictive of later reading failure. While there is accumulating data to support the contention that early language deficit is the most commonly identified source of later reading failure, most procedures today have lost sight of the need to incorporate general intellecutal ability level in the process of early prediction of learning ability. How can a deficit in specific neuropsychological functioning be identified for a given child except within the context

of general intellectual functioning? It appears that neuropsychological theorizing has lead to applied learning disability screening beyond present knowledge of neurodevelopment of the five year old. The approach utilized in the present study is to return to the learning disability predictive dilemma via use of the best known predictor of school success, general intelligence, along with a traditional vocabulary test to evaluate the efficacy of early prediction of the most commonly occurring form of reading disability, i.e., language deficiency as suggested by the comprehensive research and reviews by Vellutino.

An increased incidence of the low Verbal/high Performance WISC profile is relatively frequent in groups of children with language and/or reading disabilities. The increased frequently of this profile in retarded readers has led many investigators to conclude that the cognitive problems of many disabled readers are related to an underlying language disorder (Belmont & Birch; Rabinovitch, Lyle, & Goyen; Huelsman; Vellutino). Several lines of research have attempted to delineate preschool or kindergarten strengths and weaknesses with a view toward specifying a pattern of intellectual or neuropsychological skills which would predict the later language/learning disability. The purpose of this study is to evaluate the stability and prediction of a language-general intelligence discrepancy at an early age (CA = 4.5) to a language/learning disability at a later age (CA = 7.8).

Procedure

The present study was undertaken as part of a comprehensive statewide early periodic screening project. This portion of the study included administration of the short form (starred items) of the Stanford

Binet Intelligence Scale, Form L-M and the Vocabulary Subtest of the WPPSI at age 4-5. Since this was a longitudinal program these same children received a WISC and WRAT at ages 7 and 8. The subjects selected for the present study included 51 children who were identified as having a language-learning disability at ages 7 to 8. The criteria of a language-learning disability was a WISC low Verbal/high Performance WISC profile (at least 12 IQ point differential and PS$\geq$ 90), and an identified reading disability of at least one year below age expectation on the Wide Range Achievement Test. The language-learning disability group had the following intellectual and reading characteristics ($\overline{VS}$ = 87.14, $\overline{PS}$ = 104.11, $\overline{FS}$ = 98.01, Reading $\overline{SS}$ = 79.25). The control group was 51 children who did not display the low Verbal/high Performance WISC at ages 7 to 8. All children with identifiable hearing loss or neurological deficit were excluded from the study. The characteristics of intellectual and reading skills of the control group were ($\overline{VS}$ = 101.25, $\overline{PS}$ = 98.67, $\overline{FS}$ = 99.23, Reading $\overline{SS}$ = 103.87). The research questions were 1) How well does a discrepancy between vocabulary and general intelligence at age 4-5 predict language learning disability at age 7-8? 2) Are there identifiable relationships between these Vocabulary and S-B scores at ages 4-5 which yield prediction of level of language (Verbal Scale), perceptual-motor (Performance Scale) or general intellectual functioning (Full Scale) at ages 7-8? and 3) Are there relationships between discrepancies of scores at ages 4-5 and WISC subtest patterns and reading ability at ages 7-8?

Results

Subjects who displayed language-learning disability at ages 7-8 were initially divided into two groups on the basis of discrepancy scores between the S-B and their WPPSI Vocabulary scores at ages 4-5. When the Vocabulary score mental age equivalent was at least one year below the S-B mental age they were considered to have a language delay. Thirty-nine of the 51 children (76%) displayed a language deficit based on this criteria prior to school entrance. Twelve of the 51 children (24%) who subsequently displayed a language-learning disability did not meet the criteria of a language delay prior to age 5. The control group had only twelve percent (6/51) who displayed a language delay prior to age 5. The χ^2 analysis indicates a significant relationship between the Vocabulary-IQ discrepancy at age 4-5 and the low Verbal/high Performance WISC-R ($\chi^2 = 43.09$, $p < .001$).

The relationships between Vocabulary scores and Stanford-Binet scores at ages 4-5 and the VS, PS, and FS IQs at ages 7-8 were examined via calculation of Pearson's r. The correlation between Vocabulary scores and PS IQ ($r = .23$) and FSIQ ($r = .30$) were not significant ($p > .01$). While the correlation of the early vocabulary measure and VS IQ was significant ($r = .43$, $p < .01$), the prediction was not considered adequate for clinical use. The correlations between the Stanford-Binet and WISC VS and PS were significant (VS-$r = .47$, $p < .01$ and PS-$r = .32$, $p < .01$), however, clinical usefulness is not justified based on this data. The stability of general intellectual functioning was exemplified by the relationship between the Stanford-Binet IQ at age 4-5 and WISC FS at age 7-8 ($r = .53$, $p < .001$).

The WRAT reading scores at ages 7-8 indicate that the group of children with a language deficit at ages 4-5 exhibit significantly greater reading disability than those children without early language delay. Within the group who displayed the low Verbal/high Performance WISC and reading problems at ages 7-8 neither the WPPSI Vocabulary ($r = .23$) or the S-B IQ ($r = .31$) were significant predictors of WRAT Reading Standard scores. However, the Vocabulary and SB IQ scores for the control group did have significant correlations with later WRAT reading scores (Vocabulary - $r = .67$, S-B IQ - $r = .73$). The WRAT mean reading scores of the language deficit group ($\bar{x} = 79.25$, $SD = 8.51$) was significantly lower than the control group ($\bar{x} = 103.87$, $SD = 7.93$) ($t = 13.31$, $p < .001$). These results suggest that there is a decreased prediction of reading skills for the language deficit group and the early language discrepancy is important as a predictor of later reading problems.

Discussion

The results of this study indicate that early discrepancy scores between language and general intelligence are suggestive of later language-learning disability. Although the correlations of early vocabulary and IQ scores and later reading ability are not high for the language deficient group, the fact that there is a significant language delay at ages 4-5 does predict a later language and reading disability at ages 7-8. Psychometric procedures which attempt to predict later IQ from early IQ scores are substantiated by this study since even for the language deficient group the S-B IQ was a relatively good predictor of later Full Scale WISC IQ. However, this traditional approach provides no apparent early indication of a later language-learning disability.

The present approach which incorporates general intellectual ability yet examines early language discrepancy scores yields a useful early indicator of later language-learning disability.

Although there are continued attempts to relate reading disability to perceptual deficits, these attempts have been less successful than the numerous studies which relate reading disability to language deficits. However, it is frequently suggested that there is a primacy of perceptual-motor functioning in the cognitive pattern of preschool or kindergarten children and that language skills are not as easily measured. Furthermore, it is suggested by some authors that the low Verbal/high Performance WISC profile identified in many disabled readers is related to a cumulative effect of the reading disability. The present study suggests that language discrepancy scores at the early age are identifiable and are predictive of later language disability and reading failure. Thus, it provides support for a linear developmental approach to language discrepancy as an early predictor of reading failure. This approach is consistent with the increasing evidence of a wide variety of psycholinguistic deficits found in retarded readers. While there are numerous reports of identifying specific and distinct types of psycholinguistic deficits in elementary age retarded readers, there appears to be support for extending this approach to preschool and kindergarten assessment. Neuropsychological research with these younger children with language deficits may identify specific language deficits (e.g., auditory discrimination and verbal memory strategies) which have been identified in older language deficient reading disabled children.